



U.S. Department  
of Transportation

Federal Aviation  
Administration

# Advisory Circular

**Subject:** SPECIFICATION FOR AIRPORT LIGHT BASES, TRANSFORMER HOUSINGS, JUNCTION BOXES, AND ACCESSORIES

**Date:** 04/29/05

**AC No:** AC 150/5345-42D

**Initiated by:** AAS-100

**Change:**

**1. PURPOSE.** This Advisory Circular (AC) contains the specifications for containers designed to serve as airport light bases, transformer housings, junction boxes, and accessories. This AC is not intended to be a compilation of currently available product designs. This AC provides the basic standard requirements for critical dimensions and performance requirements to which all manufacturers shall demonstrate compliance.

**2. EFFECTIVE DATE.** Effective 6 months after the date of this circular, only that equipment qualified in accordance with this specification will be listed in AC 150/5345-53, Airport Lighting Equipment Certification Program.

- a. Manufacturers who, prior to the effective date of this AC, are certified manufacturers of Class I, Type L-867 and Type L-868 bases under the previous AC 150/5345-42C will maintain their certification under this new AC for the Class IA bases providing they satisfactorily complete any additional qualification testing required as part of this AC.
- b. Manufacturers who, prior to the effective date of this AC, are certified manufacturers of Class II Type L-867 bases under the previous AC 150/5345-42C will maintain their certification under this new AC for the Class IIA bases providing they satisfactorily complete any additional qualification testing required as part of this AC.
- c. Manufacturers who are currently certified to manufacture 10" diameter Type L-868 bases may maintain their 150/5345-42C certification listing for spacers and extensions under Class IA in this revised AC in order to service those airports with existing 10" diameter taxiway centerline fixtures. These items must be fabricated and certified to the appropriate Class as defined in this Advisory Circular. Appendix figure A-1 provides the design dimensional details. New base installations should not have 10" diameter L-868 bases.

**3. CANCELLATION.** AC 150/5345-42C, Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories, dated 9/8/89, is canceled.

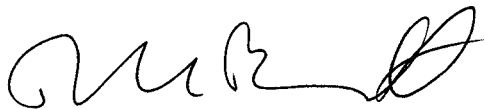
**4. APPLICATION.** The specifications contained in this AC are recommended by the Federal Aviation Administration (FAA) in all applications involving development of this nature. For

airport projects receiving Federal funds under the airport grant assistance program, the use of these standards is mandatory.

## **5. PRINCIPAL CHANGES.**

- a. Redefining of Existing Classes and Addition of New Classes
  - (1) New Class IA, formerly Class I, with added design and testing requirements for type L-867 and L-868 bases
  - (2) New Class IB for type L-867 and L-868 bases
  - (3) New Class IIA, formerly Class II, with added design and testing requirements for type L-867 base
  - (4) New Class IIB for type L-867 base
- b. Type L-867 Bases
  - (1) Added additional load testing for adjustable height base
  - (2) Added Class IB metallic and Class IIB non-metallic bases for use at airports using potassium acetate deicing fluids
  - (3) Removed figures detailing suggested design for adjustable height base
  - (4) Changed the top flange ID and body ID dimensional requirements
- c. Type L-868 Bases
  - (1) Added Class IB metallic bases for use at airports using potassium acetate deicing fluids
  - (2) Removed Class II base
  - (3) Added 8" Class IA and Class IB base
  - (4) Added provision for the use of metal inserts in base flange along with flange bolt torque testing
  - (5) Increased load test requirement
  - (6) Removed 10" base (see above note 2.c.)
  - (7) Optional protective dam to spacer rings added
  - (8) Added fatigue and impact testing requirements for other than ASTM A36 metals
- d. Type L-869 Bases
  - (1) Removed junction box

**6. METRIC UNITS.** To promote an orderly transition to metric units, this AC includes both English and metric dimensions. The metric conversions may not be exact equivalents, and until there is an official changeover to the metric system, the English dimensions will govern.



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Director of Airport Safety and Standards

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## Section 1. SCOPE

This specification sets forth the requirements for light bases, transformer housings, junction boxes, and related accessories. This specification covers several types, classes, and sizes of bases.

**1.1 Type.** The type designation of the bases distinguishes their application as follows:

- |            |  |
|------------|--|
| Type L-867 | Bases for applications subject to occasional light vehicular loading but no aircraft or other heavy vehicular loading. |
| Type L-868 | Bases for applications subject to aircraft and other heavy vehicular loading.  |

**1.2 Class.** The class designation applies as follows:

- |           |  |
|-----------|--|
| Class IA  | Bases that are fabricated from metal in exact conformance to the dimensions and requirements specified herein.   |
| Class IB  | Bases that are fabricated from metal in exact conformance to the dimensions and requirements specified herein and which have been subjected to corrosion testing and found resistant to deicing fluids containing potassium acetate.                                 |
| Class IIA | Bases that are fabricated from non-metallic materials in exact conformance to the dimensions and requirements specified herein.  |
| Class IIB | Bases that are fabricated from non-metallic materials in exact conformance to the dimensions and requirements specified herein and which have been subjected to corrosion testing and found resistant to deicing fluids containing potassium acetate.                |
| Note 1    | Bases which meet the Class IB or Class IIB requirements are also considered to meet Class 1A or Class IIA requirements respectively.   |
| Note 2    | Bases that are fabricated as either Class IA or Class IB are to perform the same exact function. The only difference between the two classes of bases is the possible difference in metal or metal surface treatment required to meet the Class IB level of testing. |
| Note 3    | Bases that are fabricated as either Class IIA or Class IIB are to perform the same exact function. The only difference between the two bases is the possible difference in material or material surface treatment required to meet the Class IIB level of testing.   |

**1.3 Size.** Five base size designations are assigned. The size refers to the nominal diameter of the base. Sizes and applicable types are as follow:

- | Size                      | Type                      |
|---------------------------|---------------------------|
| Size A - 8 inch (203 mm)  | Type L-868                |
| Size B - 12 inch (305 mm) | Type L-867 and Type L-868 |

Size C - 15 inch (381 mm)    Type L-868

Size D - 16 inch (406 mm)    Type L-867

Size E - 24 inch (610 mm)    Type L-867



## Section 2. APPLICABLE DOCUMENTS

The following documents are referenced or complement the information presented in this AC:

**2.1 FAA Advisory Circulars.** FAA AC listed below contains information pertinent to this specification. Copies of the current edition of the AC may be obtained at no charge from the following FAA website:

<http://www.faa.gov/arp/150acs.cfm?ARNav=acs>

AC 150/5340-30

Design and Installation Details for Airport Visual Aids

**2.2 Federal Specifications.** The following Federal specification (in effect on the date of application for qualification) forms a part of this specification and is applicable to the extent specified herein. Copies of Federal specifications may be obtained at no charge from the General Services Administration Offices in Washington, DC, and other cities, or from the following website:

<http://apps.fss.gsa.gov/pub/fedspecs/>

QQ-Z-325

Zinc Coating, Electrodeposits, Requirements for

**2.3 Military Standards and Specification.** The following Military Standards and Specifications (in effect on the date of application for qualification) form a part of this specification and are applicable to the extent specified herein. Copies of military standards and specifications may be obtained at no charge from: Commanding Officer, ATTN: Code 1052, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120, or from the following website:

<http://www.dodssp.daps.mil/>

### 2.3.1 Military Standards.

MIL-STD-105

Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-810

Environmental Test Methods

### 2.3.2 Military Specification.

MIL-P-26915

Primer Coating, Zinc Dust Pigmented, for Steel Surfaces

**2.4 American Society for Testing and Materials (ASTM) Specifications, Test Methods, Standard Practices, and Recommended Practices.** The following specifications, test methods, standard practices, and recommended practices (in effect on the date of application for qualification) form a part of this specification and are applicable to the extent specified herein. Copies of ASTM specifications, test methods, and recommended practices may be obtained from the American Society for Testing and Materials, or from the following website:

<http://www.astm.org>

A 153

Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

A 385-03	Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
A123/A123M-02	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
B 633	Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
C 109	Test Method for Compressive Strength of Hydraulic Cement Mortars
C 617	Standard Practice for Capping Cylindrical Concrete Specimens
C 827	Early Volume Change of Cementitious Mixtures
D 2240	Standard Test Method for Rubber Property-Durometer Hardness

**2.5 American National Standards Institute (ANSI).** The following standard (in effect on the date of application for qualification) forms a part of this specification and is applicable to the extent specified herein. Copies of ANSI standards may be obtained from the National Standards Institute, or from the following website:

<http://www.ansi.org/>

B46.1                      Surface Texture

## **2.6 Miscellaneous Documents.**

The Design, Installation and Maintenance of In-Pavement Airport Lighting by Arthur S. Schai, F.I.E.S. Library of Congress Catalog Card Number 86-81865. This document does not form a part of this specification but is listed as valuable resource material on the design and installation of light bases. (Reference AC 150-5340-30 for installation details and options.)

### Section 3. REQUIREMENTS

#### 3.1 General Description and Intended Use.

**3.1.1 Type L-867 Bases.** Type L-867 is used as a mounting base for airport lights, as a transformer housing, and as an electrical junction box. Type L-867 base shall be designed to withstand occasional light vehicular loads. It is subject to direct earth burial with and without concrete backfill.

**3.1.2 Type L-868 Bases.** Type L-868 is used as a mounting base for in-pavement airport lights, as housing for series circuit transformers, and as an electrical junction box. It shall be designed to withstand aircraft and other heavy vehicular loadings. The design must allow the installation of any in-pavement fixture, designed for mounting on the specified base size, to do so without any modification of the base whether the mounting is a new installation, or on a base that has been modified in height due to pavement elevation changes. The base, when installed, must contain all components that are manufactured to the same type, except in the case when a type L-868 is converted to a type L-867 application.

The Type L-868 top flange and base must be designed to meet the dimensional requirements and performance requirements, as detailed in this document, in order to assure proper mating between base and in-pavement lighting fixture.

**3.1.3 General Accessories.** Accessories are used to make corrections, and adjustments to Type L-867 and Type L-868 bases, and to facilitate proper performance of the lighting fixture which the base supports. Examples are listed below, and when used in conjunction with a base specified in this AC, shall not reduce the performance capabilities of that base.

**3.1.3.1 Spacer Rings.** Spacer rings are available in various designs depending on the application and are available in various thicknesses and diameters and are generally installed between the base flange and the light fixture or other accessory. See Figures 3 and 8 for minimum and maximum height. In order to preserve the base integrity and proper bolt torque, a maximum of three spacer rings (Schai document, reference par.2.6) may be stacked together. Each type of L-868 spacer ring, when interfaced to the fixture housing, may be provided with a protective dam that encircles the spacer ring. The protective dam is  $\frac{1}{8}$ " shorter than the fixture housing it protects and has an ID that is a maximum  $\frac{1}{4}$ " greater than the OD of the fixture housing. The OD of the protective dam shall not exceed the OD of the base flange ring. The various types of spacer rings are noted below.

**NOTE 1:** *The protective dam prevents grout, sealant, or other pavement material from sealing the fixture in place and preventing easy maintenance access to the fixture or base.*

**NOTE 2:** *On field adjustable bases and extensions the protective dam may be integral to the base or extension top flange ring as long as the requirements noted above and the base or extension top flange ring dimensions comply with the dimensional requirements of this advisory circular.*

**3.1.3.1.1 Flat Spacer Ring.** A flat spacer ring is used to provide height adjustment for Type L-867 or Type L-868 bases.

**3.1.3.1.2 Grooved Spacer Ring.** A grooved spacer ring, when used with a provided “O” ring gasket, is used to provide a seal between the in-pavement fixture and spacer ring for the purpose of minimizing the entrance of surface water and other liquids into the Type L-868 base.

**3.1.3.1.3 Tapered Spacer Ring.** Tapered spacer rings are used to provide level and/or height correction for out-of-level Type L-868 and L-867 bases.

**3.1.3.1.4 Azimuth Correction Spacer Ring.** Azimuth correction spacer rings are used to correct the alignment of light fixtures attached to misaligned Type L-868 bases.

**3.1.3.2 Conduit Connections.** Conduit connections permit connection of underground conduit to the bases. Conduit connections (number, type, size, and location) are to be provided as specified and must meet the environmental requirements of the Class base with which they are utilized. Conduit connections may include hubs, grommets, or other devices suited for the application.

**3.1.3.3 Adapter Rings.** Adapter rings are used for converting the bolt circle of an existing base to that of a fixture having a different bolt circle. No modification of the existing base shall be required. All fixture mounting bolts must have at least ½” of thread engagement into the ring.

**3.1.3.4 Base Extensions.** Base extensions are used to provide height adjustments to both Type L-867 and Type L-868 bases. They are used with bases when the required new elevation exceeds the capability of spacer rings to obtain it.

Base extension capability can be provided by installing either a fabricated appropriate height extension or a field adjustable height extension that conforms to the top flange of an existing type base and that has the same dimensional top flange and fixture clearance as the existing base. Care should be taken to ensure the proper Class of extension is utilized. Extensions are equal or greater than 1.75" for Type L-867 and 2.00" for Type L-868. Extensions and spacers will be dimensioned as shown in Figures 3 and 8.

Type L-867 bases with provisions for height adjustment may be specified to meet local conditions. These base extensions, which rely on the top flange and the embedment material to support the load, are not suitable for direct earth burial. If the adjustable height base is intended to support the load without top flange and embedment assistance, it is suitable for direct earth burial and must be capable of withstanding the full load test requirement at its maximum extension.

All bases that utilize a method of height adjustment that is integral to the base or extension and is intended for field adjustment must during qualification testing be subject to a torque test to ensure there will be no top flange rotation under normal operating conditions. Reference par 4.1.7, 4.2.8 and 4.3.8.

**3.1.3.5 Covers.** Various covers are available to facilitate the proper installation of bases. All covers shall utilize manufacturer furnished fully threaded 18-8 stainless steel hex head 3/8 inch bolts sufficiently long to provide full thread engagement into the mounting surface.

**3.1.3.5.1 Blank Covers.** Blank covers are used to provide a cover for bases when no light fitting is to be installed. They shall be metallic and meet the applicable dimensional requirements of the type base to which they are attached. For Type L-868 load bearing base, the cover shall be equal in thickness to the light fixture. For Type L-867B and Type L-867D non-load bearing bases the cover shall be a minimum of 0.375". For Type L-867E base, the cover shall be a minimum of 0.500". Covers thicker than .75", shall have (2) opposite holes of the (6) 7/16" through holes tapped ½"-13, as a means to affix a lifting eye for ease of removal. All cover plates ½" or thicker shall have all bolt holes counter-bored 1.125" x 3/8" deep.

**3.1.3.5.2 Mud Covers.** Mud covers may stand alone or may be used in conjunction with plywood covers on Type L-867 and Type L-868 bases to protect the base flange during construction, and to include surface marking to facilitate locating the center of the base when coring out to locate the base after pavement overlay. Mud covers are appropriately sized for the specific bases they are to protect.

**3.1.3.5.3 Shipping Covers.** Plywood covers are used to protect bases during shipping and installation and are to be installed on all base or base extension shipments. For all galvanized bases, a 3 mil poly shipping gasket may be installed between the base and plywood cover or, as an alternative, the plywood cover shall be waxed on the bottom surface to eliminate the bonding action of the plywood and zinc. The Type L-868 plywood cover should also be waxed on the OD edge to facilitate easy removal from any surrounding embedment material. Plywood shall be exterior grade ½" thick bb/cc or other material of equal strength and weather resistance (reference figure 9) for Type L-867 and equal to the thickness of the light fixture (0.75" or 1.25") to be installed on the Type L-868 base. When shipped with a mud cover on top, the total thickness of mud cover and plywood cover shall equal the thickness of the light fixture.

**NOTE:** *The thickness of the fixture is determined to be the height of fixture flange at the OD of the fixture.*

**3.1.3.6 Grounding Lugs.** For the purpose of enhancing safety, each base shall have installed, by the manufacturer, an internal and external ground strap that is available for the purpose of attaching a ground lug that is connected to an earth ground or a safety ground conductor installed in the series circuit conduit.

**3.1.3.7 Drains.** The conduit/base system, which protects the series circuit cable, should have drains installed in the bases at low points in the system to provide for drainage of water and deicing fluids away from the base and conduit system, which if allowed to pool for long periods of time, will hasten corrosion of the conduit/base system.

**3.2 Fabrication and Materials.** Bases and related accessories, designed to function as light bases, transformer housings, and junction boxes, shall be fabricated of suitable material to meet the following standards. Appropriate separation material must be used between dissimilar metals to prevent galvanic action between flange rings, spacer rings etc. Copper ground components and stainless steel bolts are exempted. This separation material must not deform at 450 psi (a load equivalent to the L-868 load test) to prevent compression and subsequent loosening of bolts.

**3.2.1 Type L-867 Bases and Extensions, Class IA and Class IB.** Type L-867 Class IA bases and extensions shall be fabricated from an appropriate metal using fabrication techniques that will produce units meeting the appropriate testing requirements of Section 4.1. Class IB bases shall be fabricated from metal using fabrication techniques that will produce units meeting the appropriate testing requirements of Section 4.1. All bases and extensions (excluding spacers and covers) shall be labeled using a suitable long lasting black ink stamp with either the letter A or B to indicate the Class suffix under which the certification has been obtained. The stamp shall be a minimum 1 inch in height and placed on the exterior wall of the base, no more than 6 inches below the base flange. All components described in this paragraph must be manufactured such that their use does not require existing bases, extensions or any existing components installed in the ground to be cut or modified in any manner. The modification of standard, certified components renders them non-standard and voids their certification

**3.2.1.1 Flange.** The dimensions of the flange shall be as shown in Figure 1. The flat surface of the flange shall be installed at an angle of  $90 \pm 0.25$  degrees to the axis of the cylindrical body. The flange shall be continuously attached to the body to provide a watertight seal.

**3.2.1.2 Body.** The body, including the sides and bottom, shall be fabricated from one or more pieces. The standard dimensions of the body shall be as shown in Figure 2. Two conduit entrances shall be provided and installed near the bottom of the base. The location and size, as shown in Figure 2, shall be considered standard. However, the location, number, type, and size can be altered to meet project requirements. Any sharp edges formed on the inside of the body shall be removed to prevent cutting or chafing of the cable insulation. The length of the body section as shown in Figure 2 shall be considered standard, but the length may be varied to meet special conditions.

**3.2.1.3 Extensions.** The dimensions of the extensions and spacer rings shall be as shown in Figure 3. Extensions for Type L-867 bases shall be ordered to length with a minimum length of 1-3/4 inches (44.5 mm) and a tolerance of  $\pm 1/16$  inch (1.5 mm). Flat spacer rings are utilized for height adjustments from 1/16 inch (1.5 mm) through 1-11/16 inches (42.86 mm) in 1/16 inch (1.5 mm) increments. In order to preserve the base integrity, a maximum of three spacer rings may be stacked together.

**3.2.1.4 Adjustable Height Type L-867, Class IA and Class IB Bases.** Adjustable height Type L-867, Class IA and IB bases shall have a provision for adjusting the height of the base top flange. Various methods of providing height adjustment are possible. The body and top flange shall have the identical dimensions as the body and top flange of the standard base. The adjustable top flange and supporting wall may mate into the base body either externally or internally of the base supporting wall. If the adjustable base is designed for installation in earth (no embedment support required), the base shall be load tested fully extended in free space. If the base requires portland cement concrete (PCC) embedment in order to meet the loading requirements, it shall be tested with supporting PCC embedment to simulate actual installation as directed by the testing laboratory. The manufacturer shall indicate by the suffix "PCC" to the catalog number that the base does not meet the load requirements of Type L-867 unless the top base flange is embedded and supported by PCC. These bases shall be dimensioned as shown in Figure 2.

**3.2.1.5 Bolts.** Bolts suitable for use in threaded holes, as shown in Figures 1 and 2, shall be supplied with each base and extension assembly. The bolts shall conform to the dimensions specified in the notes in Figures 1, 2, and 3 and shall be fully threaded and fabricated from 18-8 stainless steel.

**3.2.2 Type L-867 Bases and Extensions, Class IIA and Class IIB.** Type L-867 bases and extensions, Class IIA and IIB, shall be fabricated from suitable materials and dimensioned so as to produce units meeting the appropriate testing requirements of Section 4.2. All bases and extensions (excluding spacers and covers) shall be labeled using a suitable long lasting black ink stamp with either the letter A or B to indicate the Class suffix under which the certification has been obtained. The stamp shall be a minimum 1 inch in height and placed on the exterior wall of the base, no more than 6 inches below the base flange. All components described in this paragraph must be manufactured such that their use does not require existing cans, extensions or any existing components installed in the ground to be cut or modified in any manner. The modification of standard certified components renders them non-standard and voids their certification.

**3.2.2.1 Flange.** The flange shall be fabricated from suitable materials and shall meet the same critical lighting fixture interface dimensions specified for Class I in Figure 1. Flange thickness and material shall be sufficient to pass the load test specified in paragraph 4.1.1. The flange shall be continuously attached to the body to provide a watertight seal.

**3.2.2.2 Body.** The body, sides, and bottom may be fabricated from one or more pieces. The sides and bottom shall be fabricated from suitable materials sufficient to pass the load test described in paragraph 4.2.1. Two conduit entrances shall be installed near the bottom of the base. The location and size, as shown in Figure 2, shall be considered standard. However, the location, number, type, and size may be altered to meet project requirements. Any sharp edges formed on the inside of the body shall be removed to prevent cutting or chafing of the cable insulation. The length of the body section as shown in Figure 2 shall be considered standard, but the length may be varied to meet special conditions.

**3.2.2.3 Extensions.** The dimensions of the extensions and spacer rings shall be as shown in Figure 3. Extensions shall be fabricated of the same materials and dimensions specified in paragraphs 3.2.2.1 and 3.2.2.2 above. Extensions shall be ordered to length with a minimum length of 1-3/4 inches (44.5 mm) and a tolerance of  $\pm 1/16$  inch (1.5 mm). Flat spacer rings are utilized for height adjustments from 1/16 inch (1.5 mm) through 1-11/16 inches (42.86 mm) in 1/16 inch (1.5 mm) increments. In order to preserve the base integrity, a maximum of three spacer rings may be stacked together.

**3.2.2.4 Adjustable Height Type L-867, Class II Bases.** Adjustable height Type L-867, Class IIA and IIB bases shall have a provision for adjusting the height of the base top flange. Various methods of providing height adjustment are possible. The body and top flange shall have the identical dimensions as the body and top flange of the standard base. The adjustable top flange and supporting wall may mate into the base body either externally or internally of the base supporting wall. If the adjustable base is designed for installation in earth (no embedment support required) the base shall be load tested fully extended in free space. The manufacturer shall indicate by the suffix "PCC" to the

catalog number that the base does not meet the load requirements of Type L-867 unless the top base flange is embedded and supported by PCC. If the base requires PCC embedment in order to meet the loading requirements, it shall be tested with supporting PCC embedment to simulate actual installation as directed by the testing laboratory. These bases shall be dimensioned as shown in Figure 2 with regard to fixture interface and critical dimensions.

**3.2.2.5 Bolts.** Bolts suitable for use in threaded holes as shown in Figures 1, 2, and 3 shall be supplied with each base and extension assembly. The bolts shall conform to the dimensions specified in the notes in Figures 1, 2, and 3, and shall be fully threaded and fabricated from 18-8 stainless steel.

**3.2.3 Type L-867 Accessories.** Various accessories are necessary to facilitate construction involving Type L-867 bases or to make corrections or adjustments to Type L-867 bases. These accessories are detailed in Figure 4.

**3.2.4 Type L-868, Class IA and Class IB Bases and Extensions.** Type L-868, Class IA bases and extensions, shall be fabricated from an appropriate metal\* and constructed in such a manner as to meet the appropriate testing requirements given in Section 4.3. Class IB bases and extensions shall be fabricated from an appropriate metal\* and constructed in such a manner as to meet the appropriate testing requirements given in Section 4.3.

\*If a material other than ASTM A36 steel is used for a major load bearing structural component, the material must meet the mechanical property yield and tensile values of A36 steel. A material with yield and tensile stress values lower than the minimum specified values of A36 steel may be used if the manufacturer can demonstrate conformance to the requirements set forth in section 4 of this specification.

All bases and extensions (excluding spacers and covers) shall be labeled using a suitable long lasting black ink stamp with either the letter A or B to indicate the Class suffix under which the certification has been obtained. The stamp shall be a minimum 1 inch in height and placed on the exterior wall of the base, no more than 6 inches below the base flange

All components described in this paragraph must be manufactured such that their use does not require existing cans, extensions or any existing components installed in the ground to be cut or modified in any manner. The modification of standard, certified components renders them non-standard and voids their certification.

**3.2.4.1 Flange.** The dimensions of the flange shall be as shown in Figure 5. The flat surface of the flange shall be installed at an angle of 90 degrees,  $\pm 0.125$  degrees, to the axis of the cylindrical body of the base. The flange shall be continuously attached to the body to provide a watertight seal. The flange faces, outside and inside diameter, shall be finished in accordance with ANSI B 46.1. Bolt hole size and placement shall be as shown in Figure 5. Bolt hole may be integral to the flange or contained in metal insert located in the flange. A specified bolt installed in the flange bolt hole shall be capable of accepting a bolt torque test as indicated in paragraph 4.3.2. As part of the base testing, any insert or remedial device used for correcting threads damaged while in service shall be tested in the base flange as part of the base in which it is intended for service.

**3.2.4.2 Body.** The body section, sides and bottom, may be formed from one or more pieces. One piece body sections shall have an anchor ring (mid-ring) attached to the



body by a continuous weld applied to the upper side and lower side of the ring as shown in Figure 6. The length of the one piece body section shown in Figure 6 shall be considered a standard, but the overall length may vary to meet specific conditions. Two 2-inch (51 mm) conduit entrances shall be provided near the bottom of the body. The location, number, and size of conduit entrances shown in Figure 6 shall be considered standard, but the size, location, and number of connections may be varied to meet specific conditions. Any sharp edges at the conduit entrances shall be removed to prevent cutting or chafing of the cable insulation. When sectional bases are specified, the sections shall be dimensioned as shown in Figure 7.

**3.2.4.3 Extensions.** Extensions shall be fabricated from the appropriate metal for either Class IA or Class IB bases. The dimensions of extensions shall be as shown in Figure 8. The minimum extension length shall be 2 inches (51 mm). Flat spacer rings shall be used for height corrections of 1/16 inch (1.6 mm) to 1-15/16 inches (49 mm) in 1/16 inch (1.6 mm) increments. Flat spacer ring dimensions are shown in Figure 8. If specified, grooved spacer rings may be used for height corrections of 1/4 inch (3.2 mm) to 1-15/16 inches (49 mm) in 1/16 inch (1.6 mm) increments.

**3.2.4.4 Adjustable Height Type L-868, Class IA and Class IB Bases.** Adjustable height Type L-868, Class IA and IB bases shall have a provision for adjusting the height of the base top flange. Various methods of providing height adjustment are possible. The body and top flange shall have the identical dimensions as the body and top flange of the standard base. The adjustable top flange and supporting wall may mate into the base body either externally or internally of the base supporting wall.

**3.2.4.5 Bolts.** Bolts suitable for use in the threaded holes as shown in Figures 5, 6, and 7 shall be supplied with each spacer ring. These bolts shall be of sufficient length to provide a full thread connection with the base flange when the spacer ring is inserted between the light fixture and the base flange. If bases or extensions are ordered without spacer rings, bolts conforming to the dimensions specified in the notes in Figures 5, 6, and 7 shall be supplied. All bolts shall be fully threaded and fabricated from 18-8 stainless steel and supplied with stainless steel locking washers.

**NOTE:** Anti-seize material is recommended to be furnished and utilized by the installing contractor when installing bolts (Reference AC 150/5340-30). Anti-seize material is normally not supplied by the base manufacturer due to the various airport preferences for different brands of material.

**3.2.5 Type L-868 Accessories.** Various accessories are necessary to facilitate construction involving Type L-868 bases or make corrections or adjustments to Type L-868 bases. These accessories are detailed in Figure 9.

**3.2.6 Ground Lug.** Ground connectors or straps shall be supplied with each base. For metallic bases, a metallic ground connector or strap shall be welded to the interior and exterior wall of each base before applying surface protection. The details and location of the ground connectors are shown in Figures 2 and 6. The location of the connector may be varied to meet specified conditions. A bronze or copper ground connector shall not be fastened to the ground connector or strap until after the base surface protection is applied. For Class II bases, the ground connector or strap shall provide a positive ground connection path to a light fixture mounting bolt. For either Class I or II the bronze or copper ground connector may be installed in the field.

**3.2.7 Drains.** If specified, a drain shall be provided in the bottom of the base prior to applying surface protection. When not otherwise specified, the drain shall be 3/4 inch in diameter.

**3.2.8 Protective Coating.** After fabrication, burrs and sharp edges shall be removed, and all ferrous metal parts shall be treated for corrosion protection. Prior to tapping operations, all parts of Class I bases, extensions, and spacer rings in excess of 1/4 inch (6.35 mm) in thickness shall be hot-dip galvanized, as specified in ASTM A123/A123M-02, and applied in accordance with ASTM A 385-03. Flanges, covers, and rings shall be wiped smooth to a flatness of  $\pm 0.010$  inch (0.254 mm). Plates and rings 1/4 inch (6.35 mm) or less in thickness, grooved extensions, and grooved spacer rings when made of ferrous metal shall be plated with zinc in accordance with the requirements of Federal Specification QQ-Z-325, Type II, Class I or hot dipped galvanized in accordance with ASTM A123/A123M-02. Tapped holes for conduit shall be protected with a polyurethane varnish or equivalent. A zinc dust primer meeting MIL-P-26915 shall be permitted for touchup. The area covered by zinc dust primer shall not exceed 10 percent of the total treated area. Any cast iron may be coated with a minimum of 2.0 mils of oxyplast powder in lieu of galvanizing. Class IA base extensions and spacer rings shall utilize surface protection, as required, meeting the appropriate testing requirements stated in Section 4.4.

## Section 4. QUALITY ASSURANCE PROVISIONS

Equipment produced under this specification may be eligible for funding for installation on airports under Federal grant assistance programs for airports. In order to be eligible for installation under Federal grant assistance programs, manufacturers of the types of equipment specified herein are required to certify or furnish proof to the airport sponsor, or the sponsor's representative, that the equipment is certified by an FAA-approved Third Party Certification Body to meet the following test specimen, and production provisions established below in Section 4.1, 4.2 and 4.3 Certification Testing. Certification testing delineated below is intended to assure that the materials and fabrication methods are adequate to provide acceptable in-service performance of bases. Certification testing is required for each type, class, and size of base produced.

**4.1 Type L-867, Class IA and Class IB Certification Testing.** Type L-867, Class IA and Class IB bases and extensions fabricated in accordance with the materials and dimensions specified herein shall be capable of passing the following tests:

**4.1.1 Type L-867, Class IA and Class IB Load Test.** Sample bases and extensions shall be subject to the load test described below. The base and cover assembly or assemblies including spacer rings, extensions, and multi-section bodies shall be bolted together and placed on a flat steel plate mounted in a standard testing machine. The test section shall be a unit in height deemed to be the maximum height to be furnished by the manufacturer with four 2-inch (50 mm) conduit entrances located in the body section, located at 90° increments, 2-1/2 inches (64 mm) from the bottom of the base. A load shall be applied to the top part of the base through a block of rubber 1-1/2 inches (38 mm) thick, with a diameter equal to the cover plate, and having a durometer hardness of 55 to 70. A load of 250 psi (1724 kPa) shall be applied uniformly over the area of the rubber block at a rate not to exceed 10,000 pounds (4536 kg) per minute. The base, or any of the components, shall be considered unsatisfactory if there is any permanent deformation or cracking of material or coating. The above test will be repeated three times. After each loading, bolts shall be checked for loss of tension. The bolts shall be torqued to the manufacturer's recommended service torque after the first two loadings. The base and/or assembly will be considered unsatisfactory if there is any loss of torque in the bolts or permanent deformation of the flange or coating after the third loading.

**4.1.1.1 Type L-867, Class IA and Class IB Load Test, Adjustable Height Base.** If the adjustable base is designed for installation in earth (no embedment support required), the base shall be tested fully extended in free space and shall be subject to the load test in paragraph 4.1.1. If the base requires PCC embedment in order to meet the loading requirements, it shall be tested to the requirements in paragraph 4.1.1 with supporting PCC embedment to simulate actual installation as directed by the testing laboratory.

**4.1.2 Type L-867, Class IA and Class IB Weld Integrity Test.** This test shall be performed after each assembly has undergone the load test described in paragraph 4.1.1. An internal air or hydraulic pressure of 12 psi,  $\pm 2$  psi, (83 kPa,  $\pm 14$  kPa) shall be maintained within the assembly using pressure fittings. The conduit entrances shall include a sample of the conduit interfaces (hub, grommet etc.) that are offered by the manufacturer for interfacing to the conduit. The conduit entrances shall include conduit stubs suitably plugged during the conducting of the test. A high foam soap or detergent solution of low surface tension shall be brushed on welds, seams, and joints to detect leakage. Alternatively, the assembly may be submerged in a tank of water

while pressurized to detect any air leakage. The assembly shall be considered unsatisfactory if leakage is evident. The conduit entrances shall be placed at least 24 inches (0.6 m) below the water surface. Any leakage of water into the assembly shall be cause for rejection.

**NOTE:** *This test is not performed on bases designed to be field height adjustable.*

**4.1.3 Type L-867, Class IA and Class IB Dimensional Tests.** Specimens shall be measured for conformance to the dimensions specified in Figures 1, 2, 3, and 4, as applicable.

**4.1.4 Type L-867, Class IA and Class IB Protective Coating Thickness Test.** When utilized, the thickness of protective coatings shall equal or exceed those specified herein. The weight of hot-dip galvanizing shall be tested according to the method described in ASTM A 153. Zinc plating thickness shall be tested by either method described in Federal Specification QQZ-325.

**4.1.5 Type L-867, Class IA and Class IB Visual Inspection.** Each unit shall be visually inspected for quality of workmanship and materials. The specified Class marking shall be inspected for correctness. Particular attention shall be given to smoothness and continuity of welds and seams, flatness and smoothness of the flange surface, complete and uniform application of the protective coating, freedom from excess zinc when applicable, and absence of burrs and sharp edges.

**4.1.6 Type L-867, Class IB Potassium Acetate Test.** Those bases and extensions certified to Type L-867 Class IB requirements shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall consist of taking a test base and filling it half full with a potassium acetate deicing fluid comprised of 50 percent potassium acetate and 50 percent water, by weight. The test base will have conduit connecting devices identical to that to be furnished with the base with conduit stubs plugged and the top of the base shall be covered with an appropriate blank cover and gasket. The test base will remain for 21 days at an elevated temperature of 90° C. After the test period the base and spacer ring shall be inspected. There shall be no evidence of corrosion or leakage.

**4.1.7 Type L-867 Class IA and Class IB Torque Test for Adjustable Height Bases.** All L-867 Class I bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test base shall be held in the maximum adjustable height position utilizing the locking method that will be utilized in the actual installation. A torque of 12,000 in-lbs shall be applied perpendicular to the vertical axis of the base utilizing a steel cover plate. The maximum torque shall be achieved within 60 seconds of the start of the test. The torque load shall be applied three times. Upon completion of the third torque loading a measurement shall be taken to determine if the base top flange has been displaced in azimuth. An azimuth displacement of 0.25 degrees or greater shall be cause for rejection. All welds or seams shall be examined for integrity and any failure shall be cause for rejection.

**4.2 Type L-867, Class IIA and Class IIB Certification Testing.** Type L-867, Class IIA and Class IIB bases and extensions fabricated from materials to dimensions as specified herein shall be capable of passing the following tests.

**4.2.1 Type L-867, Class IIA and Class IIB Load Test.** Sample bases and extensions shall be subject to the load test described in paragraph 4.1.1 above.

**4.2.2 Type L-867, Class IIA and Class IIB Weld Integrity Test.** Sample bases and extensions shall be subject to the leakage test described in paragraph 4.1.2 above.

**NOTE:** *This test is not performed on bases designed to be field height adjustable.*

**4.2.3 Type L-867, Class IIA and Class IIB Temperature Shock Test.** Temperature shock test requirements apply only to Class II, non-metallic, Type L-867 bases. A temperature shock test shall be conducted on a completed non-metallic base assembly. The test shall be performed according to MIL-STD-810, Method No. 503.2, Section II, Procedure I. The high test temperature shall be +130° F (+54° C) and the low test temperature shall be -65° F (-54° C). This test shall be conducted on the assembly after the load test described in paragraph 4.1.1 has been concluded. Any cracking or joint separation of the materials making up the base assembly shall be cause for rejection.

**4.2.4 Type L-867, Class IIA and Class IIB Dimensional Tests.** Specimens shall be measured for conformance to the dimensions specified in Figures 1, 2, 3, and 4, as applicable. Mounting flange and base wall thicknesses shall be measured and shall be equal to or greater than those required to pass the load test and torque test described in paragraph 4.1.1 above.

**4.2.5 Type L-867, Class IIA and Class IIB Protective Coating Thickness Test.** For components of the base or assembly requiring protective coatings, the thickness of protective coatings shall be tested in accordance with paragraph 4.1.4 above.

**4.2.6 Type L-867, Class IIA and Class IIB Visual Inspection.** Bases shall be visually inspected in accordance with paragraph 4.1.5.

**4.2.7 Type L-867, Class IIB Potassium Acetate Test.** Those bases and extensions certified to Type L-867 Class IA requirements shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall be conducted in accordance with paragraph 4.1.6.

**4.2.8 Type L-867, Class IIA and Class IIB Torque Test for Adjustable Height Bases.** All L-867 Class II bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test shall be conducted in accordance with paragraph 4.1.7.

**4.3 Type L-868, Class IA and Class IB Certification Testing.** Type L-868, Class I bases and extensions fabricated in accordance with the materials and dimensions specified herein shall be capable of passing the following tests.

**4.3.1 Type L-868, Class IA and Class IB Load Test.** Sample bases and extensions shall be subject to the load test described in paragraph 4.1.1 above with the following exception. A load of 450 psi (3103 kPa) shall be applied uniformly over the area of the rubber block at a rate not to exceed 10,000 pounds (4536 kg) per minute. The test section shall be a unit in height deemed to be the maximum height, to be furnished by the manufacturer. For 8 inch Type L-868 1 inch (25mm) conduit entrances shall be used.

**4.3.2 Type L-868, Class IA and Class IB Fatigue Test.** If a material other than ASTM A36 steel is used for a major load-bearing structural component, the material must have a fatigue limit or endurance limit no less than 27 ksi (186 MPa). Specimens from the proposed material must be able to withstand a minimum of  $5 \times 10^8$  cycles at 27 ksi (186 MPa) by a standard R.R. Moore rotating beam fatigue test using polished specimens. No less than three tests shall be conducted to validate the material's fatigue properties.

**4.3.3 Type L-868, Class IA and Class IB Impact Test.** If a material other than ASTM A36 steel is used for a major load-bearing structural component, the material must have an impact toughness equal to or greater than 15 ft-lb (20 J) at 20°F (-7°C), per the Charpy V-notch test specified in ASTM E23 Standard Test Methods for Notched Bar Impact Testing of Metallic Materials. No less than three tests shall be conducted to validate the material's impact properties.

**4.3.4 Type L-868, Class IA and Class IB Flange Bolt Torque Test.** Flanges shall be tested by inserting 18-8 stainless steel fixture mounting bolts in all 6 bolt holes and torque all bolts to failure. Any cracking or permanent deformation of the flange material shall be cause for rejection. Any rotation or distortion of installed remedial devices or replaceable inserts shall also be cause for rejection.

**4.3.5 Type L-868, Class IA and Class IB Weld Integrity Test.** Sample bases and extensions shall be subject to the leakage test described in paragraph 4.1.2 above.

**NOTE:** *This test is not performed on bases designed to be field height adjustable.*

**4.3.6 Type L-868, Class IA and Class IB Dimensional Tests.** Specimens shall be measured for conformance to the dimensions specified in Figures 5-9.

**4.3.7 Type L-868, Class IA and Class IB Protective Coating Thickness Test.** For components of the base or assembly requiring protective coatings, the thickness of protective coatings shall be tested in accordance with paragraph 4.1.4.

**4.3.8 Type L-868, Class IA and Class IB Visual Inspection.** Specimens shall be subject to visual inspection as described in paragraph 4.1.5.

**4.3.9 Type L-868, Class IB Potassium Acetate Test.** Bases and Extensions shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall be conducted in accordance with paragraph 4.1.6.

**4.3.10 Type L-868, Class IA and Class IB Torque Test for Adjustable Height Bases.** All L-868 bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test shall be conducted in accordance with paragraph 4.1.7, except a torque of 100,000 in-lbs shall be applied.

#### **4.4 Production Testing**

**4.4.1 Lot Size.** The lot size shall be equal to the daily production rate.

**4.4.2 Sample Size and Acceptance Criteria.** Production testing shall be based on the procedures given in MILSTD-105, Sampling Procedures and Tables for Inspection by Attributes. Sample size and acceptance criteria shall be based on Table 1 (Sample Size Code Letters), General Inspection Level I, Table II-A (Single Sampling Plans for Normal Inspection), and an Acceptable Quality Level (AQL) of 2.5. Note that normal inspection may be switched to reduced inspection provided the conditions set forth in MIL-STD-105 are met.

**4.4.3 Retesting.** If the lot is rejected, the remainder of the lot (excludes samples tested and inspected under paragraph 4.2.2) may be tested and inspected on an individual basis. As an alternative to individual testing and inspection, the remainder of the lot may be tested using criteria in MIL-STD-105 for multiple sampling. Table IVB, Multiple Sampling Plans for

Tightened Inspection, using the appropriate sample size and an AQL of 2.5, shall be used. Should the lot fail under the multiple sampling plan criteria, all units shall be inspected and tested individually and repaired as necessary. Any samples that fail under any of the above criteria shall be repaired prior to shipment.

#### **4.4.4 Type L-867, Class IA and Class IB.**

**4.4.4.1 Dimensional Tests.** Random samples from each lot shall be subjected to dimensional tests as described in paragraph 4.1.3 above.

**4.4.4.2 Visual Inspection.** Random samples from each lot shall be subjected to visual inspection as described in paragraph 4.1.5 above.

**4.4.4.3 Weld Integrity Test.** Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

**4.4.4.4 Torque Test for Adjustable Height Bases.** Random samples from each lot shall be subjected to the torque test described in paragraph 4.1.7, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2 if the method meets with the approval of the third party testing laboratory.

#### **4.4.5 Type L-867, Class IIA and Class IIB.**

**4.4.5.1 Dimensional Tests.** Random samples from each lot shall be tested in accordance with paragraph 4.2.4 above.

**4.4.5.2 Visual Inspection.** Random samples from each lot shall be visually inspected in accordance with paragraph 4.1.5.

**4.4.5.3 Weld Integrity Test.** Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

**4.4.5.4 Torque Test for Adjustable Height Bases.** Random samples from each lot shall be subjected to the torque test described in paragraph 4.1.7, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2 if the method meets with the approval of the third party testing laboratory.

#### **4.4.6 Type L-868, Class IA and Class IB.**

**4.4.6.1 Dimensional Test.** Random samples from each lot shall be tested for conformance to the dimensional test described in paragraph 4.3.6 above.

**4.4.6.2 Visual Inspection.** Random samples from each lot shall be inspected for conformance to the requirements in paragraph 4.3.8 above.

**4.4.6.3 Weld Integrity Test.** Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

**4.4.6.4 Torque Test for Adjustable Height Bases.** Random samples from each lot shall be subjected to the torque test described in paragraph 4.3.10, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2 if the method meets with the approval of the third party testing laboratory. If no welds exist in the top section this test is not required.



## **Section 5. PREPARATION FOR DELIVERY.**

**5.1 Packing.** Equipment shall be carefully packaged for shipment and delivery to avoid damage and/or corrosion. Protective covers are to be included on all bases. (See paragraph 3.1.3.5.3)

**5.2 Marking.** Equipment shall be marked for shipment with the consignee's name and address, and other pertinent information as needed by the installer. Marking shall include the following statement, "Installer: These products have been packed and shipped in accordance with FAA recommendations. Products are to be handled carefully so no damage to the structure or finish will occur during the installation process."

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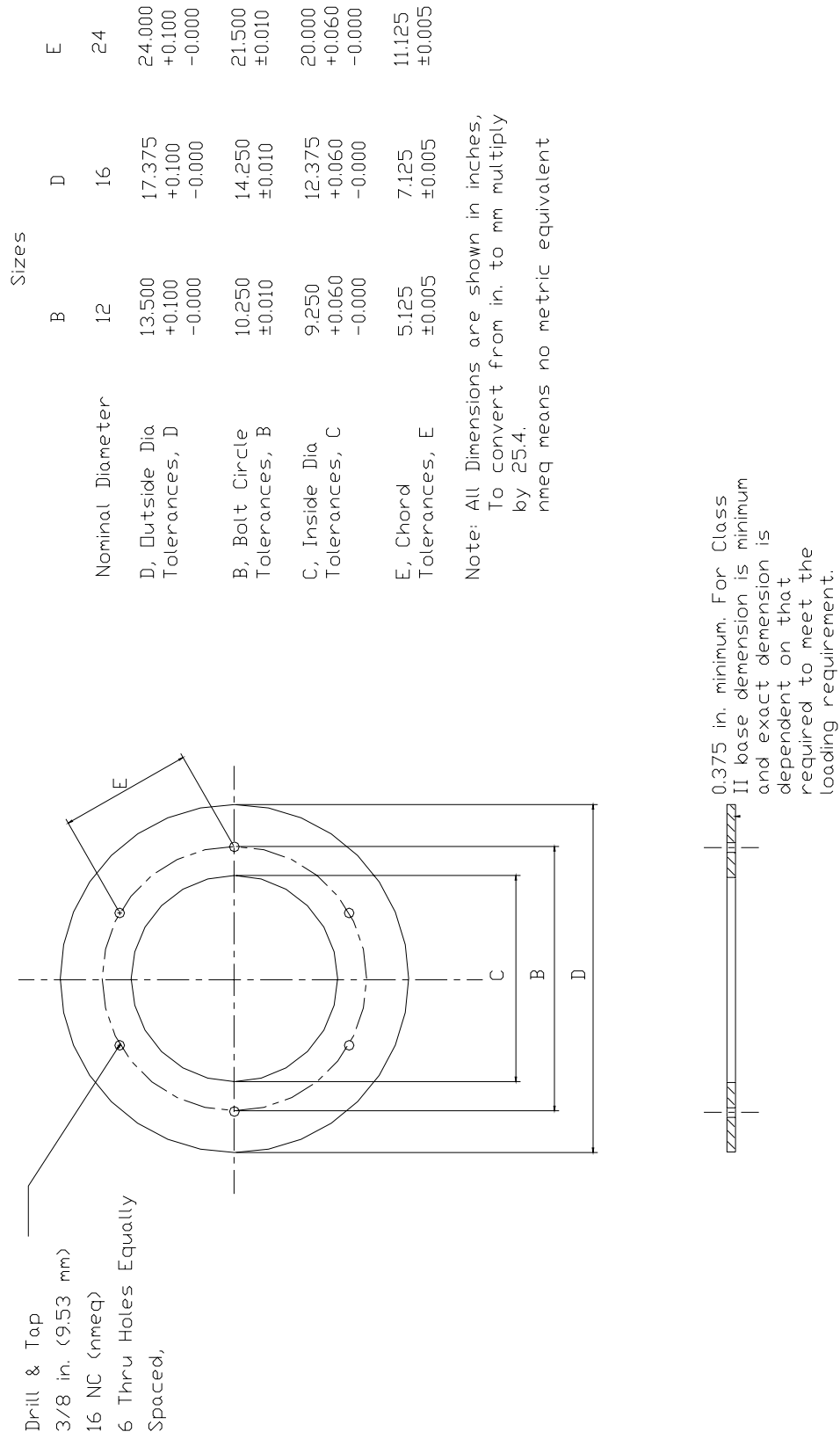
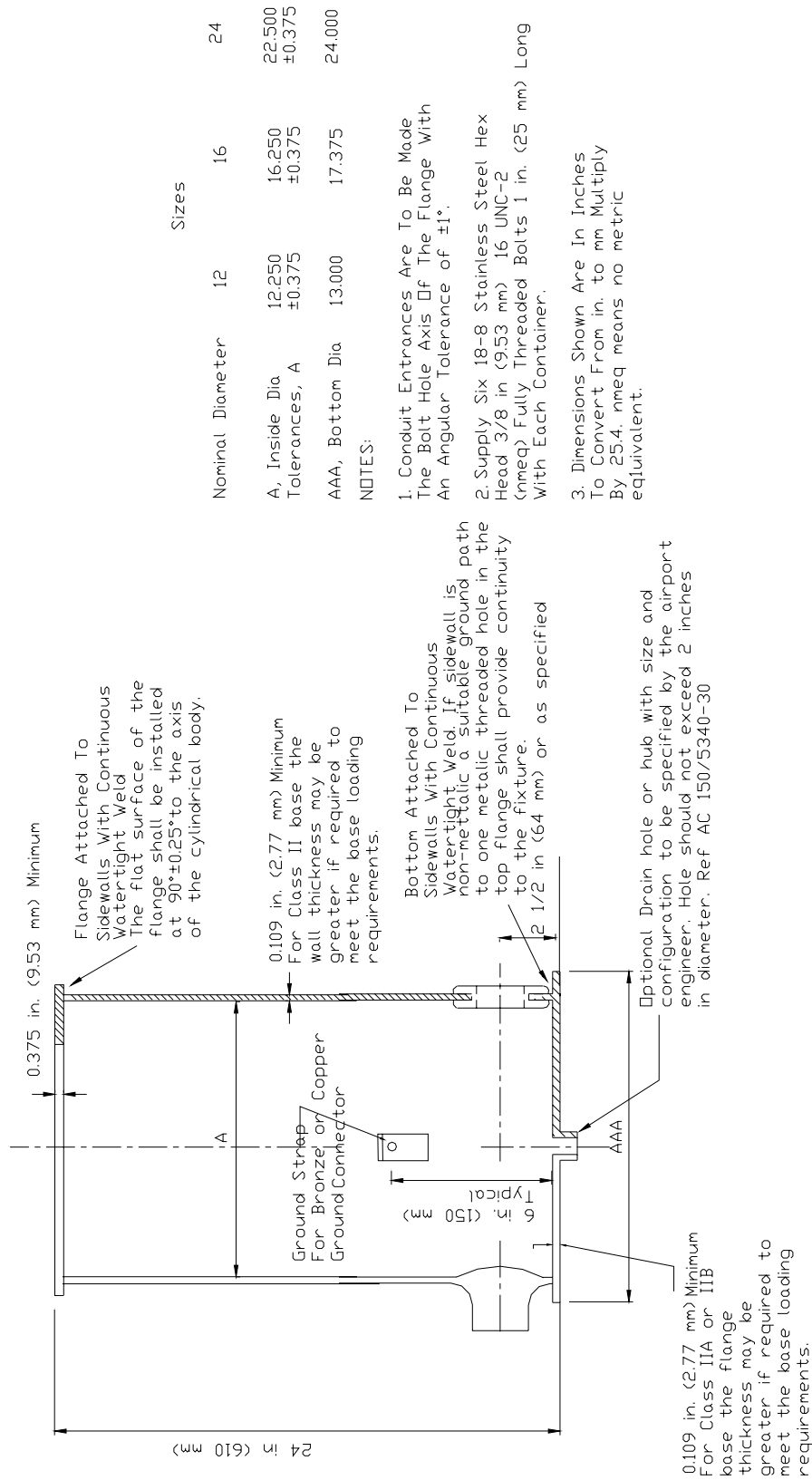


Figure 1. Flange, Type L-867, Class IA, Class IB, Class IIA, Class IIB



Nominal Diameter		12		16		24	
A, Inside Dia		12.250		16.250		22.500	
Tolerances, A		±0.375		±0.375		±0.375	
AAA, Bottom Dia		13.000		17.375		24.000	

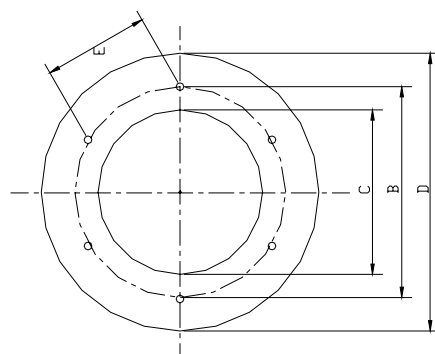
NOTES:

1. Conduit Entrances Are To Be Made The Bolt Hole Axis Of The Flange With An Angular Tolerance of ±1°.
2. Supply Six 18-8 Stainless Steel Hex Head 3/8 in (9.53 mm) 16 UNC-2 (mef) Fully Threaded Bolts 1 in. (25 mm) Long With Each Container.
3. Dimensions Shown Are In Inches To Convert From in. to mm Multiply By 25.4. mmeq means no metric equivalent.

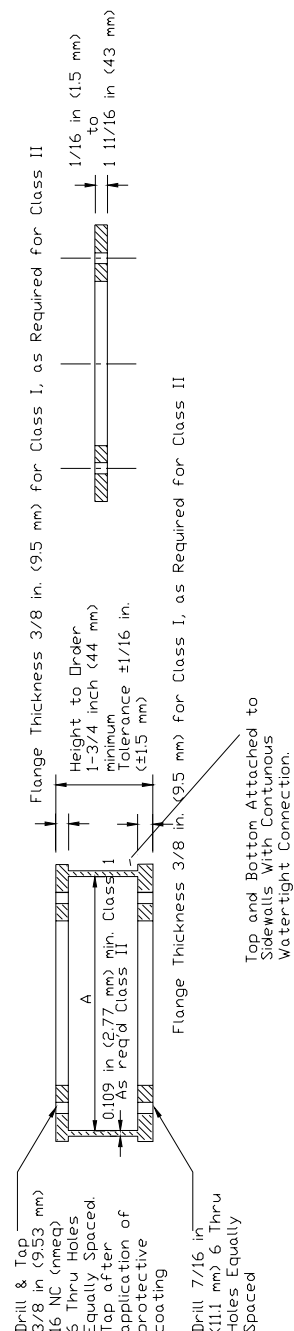
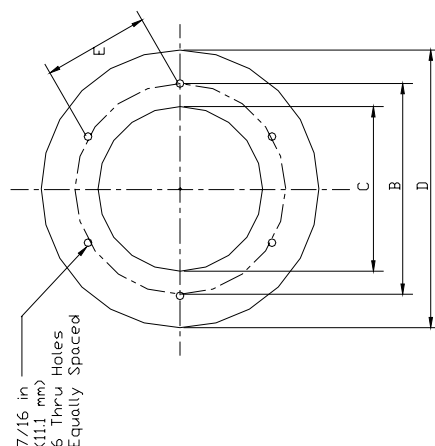
Figure 2. Body, Type L-867, Class IA, Class IB, Class IIA, Class IIB

Nominal Diameter	Sizes			E	NOTES:
	B	D			
D, Outside Dia Minimum	12	16		24	1. Holes In Top And Bottom Of Extensions Shall Be Aligned. 2. Supply 6 Stainless Steel 18-8 Hex Head 3/8 in. (953 mm) 16 UNC (nmeq) Bolts With Each Extension Sufficiently Long To Provide Minimum 1/2 in. (13 mm) Thread Engagement With Base Container. Supply 6 Stainless Steel 18-8 Hex Head 3/8 in. (953 mm) 16 UNC (nmeq) Bolts With Each Extension Sufficiently Long To Provide Minimum 1/2 in. (13 mm) Thread Engagement With Extension Flange Ring. 3. Tabulated Dimensions Are In Inches, To Convert From in. to mm Multiply By 25.4, nmeq means no metric equivalent.
B, Bolt Circle Tolerances, B	13.500	17.375		24	
C, Inside Dia Tolerances, C	10.250 ± 0.010	14.250 ±0.010		21.500 ±0.010	
E, Chord Tolerances, E	9.250 +0.060 -0.000	12.375 +0.060 -0.000		20.000 +0.060 -0.000	
A, Actual Dia Minimum	5.125 ±0.005	7.125 ±0.005		11.125	
	12.250 Minimum	16.250 Minimum		22.500	
	13.600 Maximum	17.475 Maximum			

## Extension



## Spacer Ring



**Figure 3. Extensions, Type L-867, Class IA, Class IB, Class IIA, Class IIB**

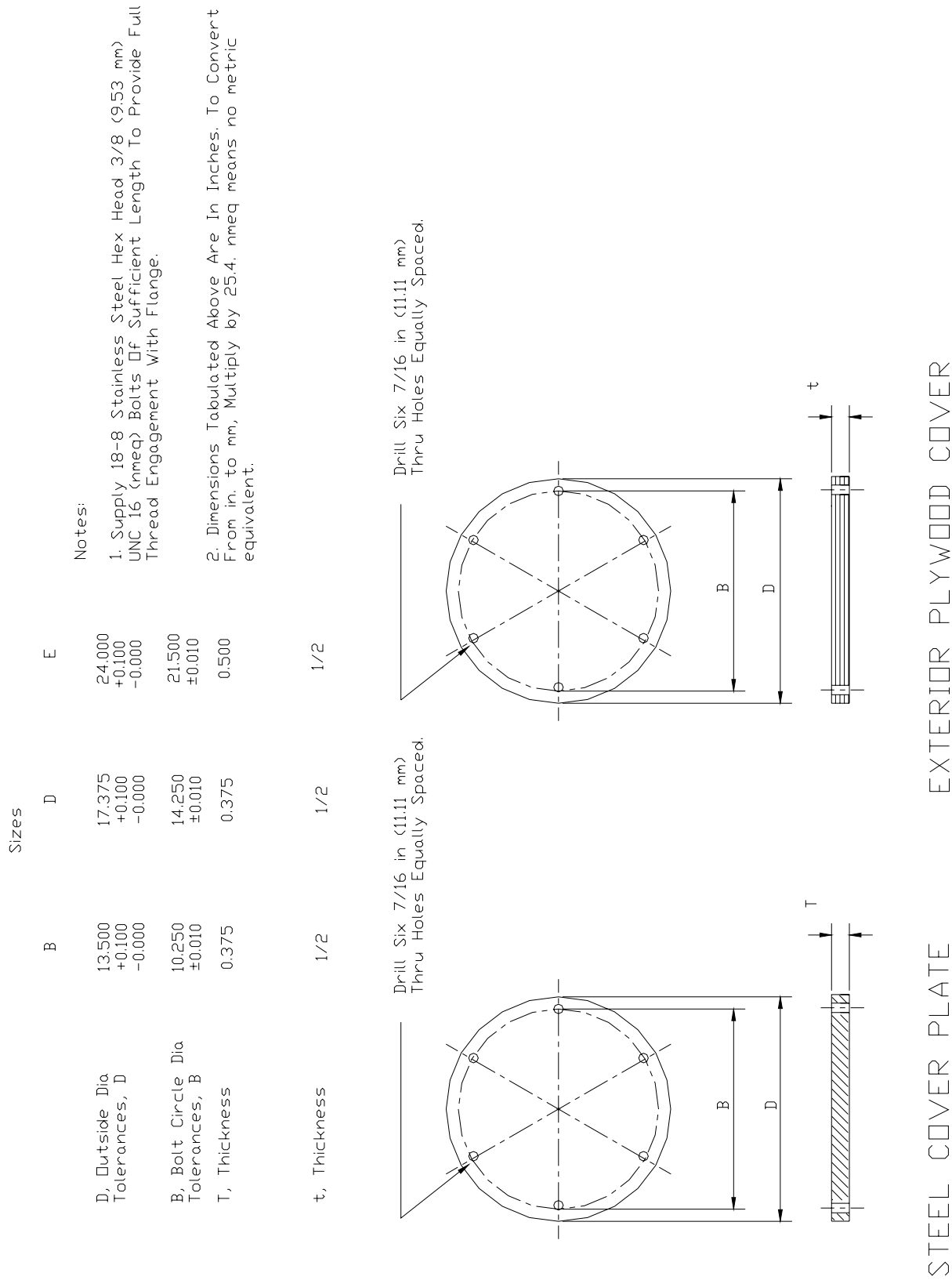


Figure 4. Accessories, Type L-867

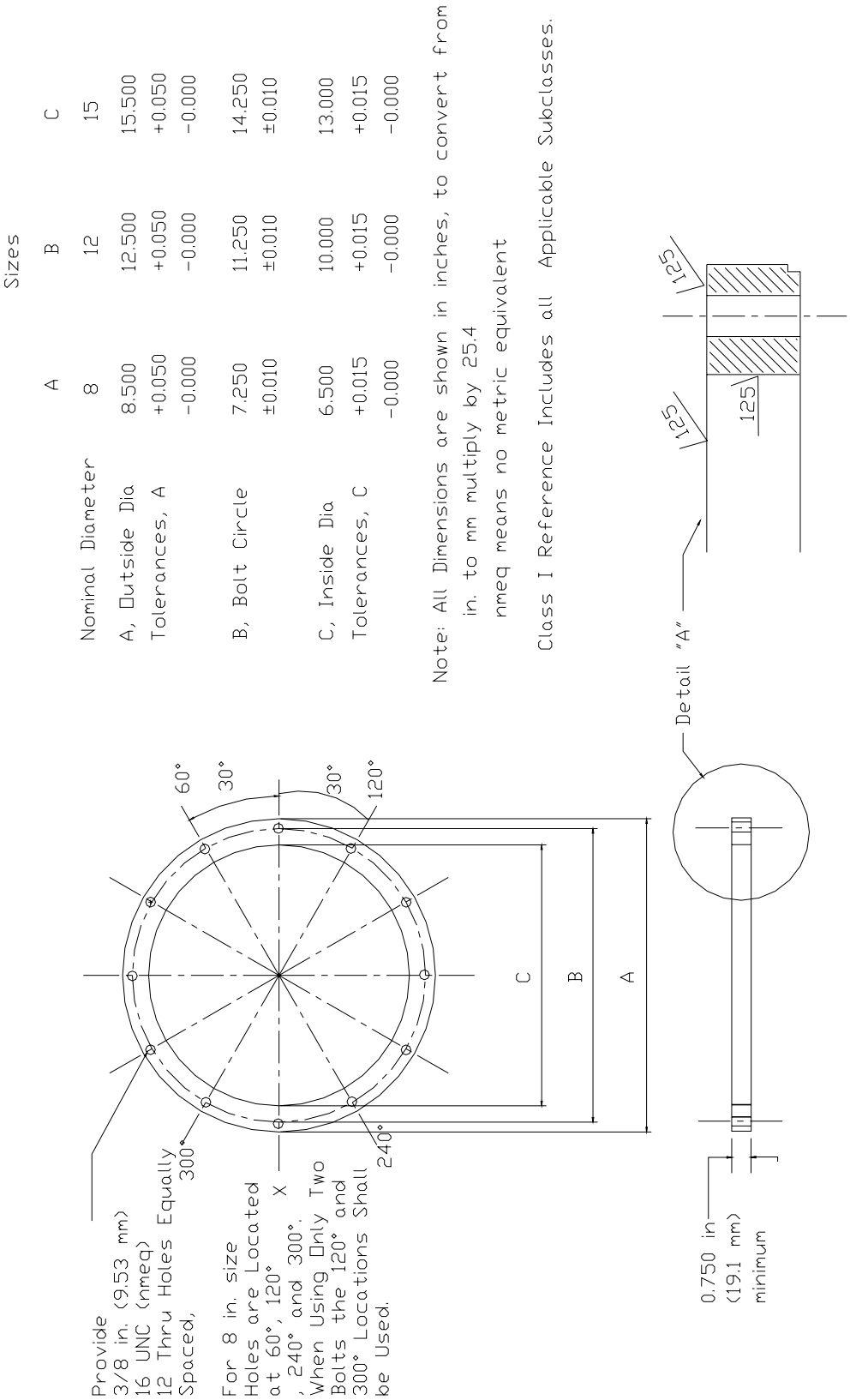
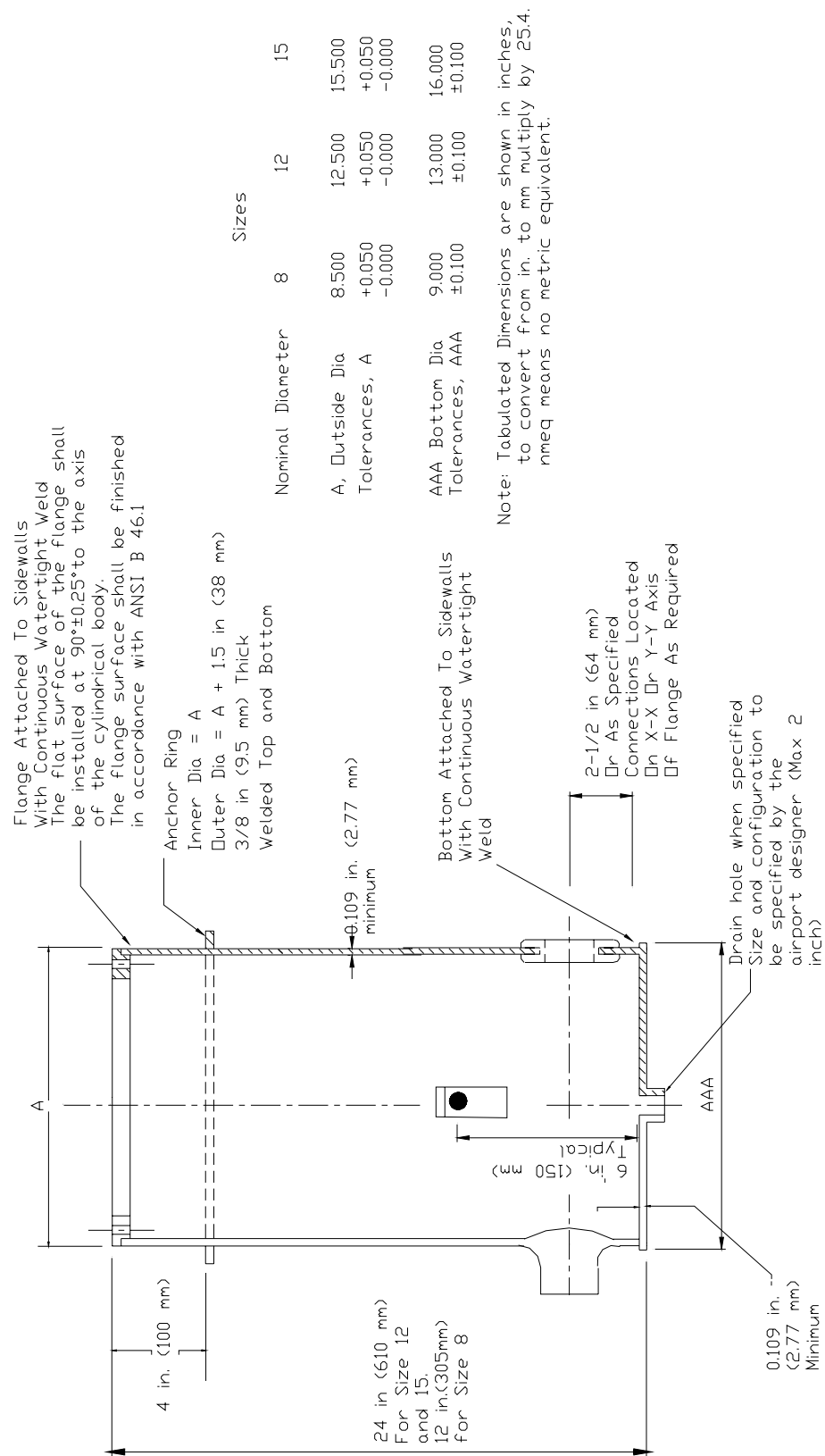


Figure 5. Flange, Type L-868, Class IA, Class IB



**Figure 6. Body, Type L-868, Class IA, Class IB**



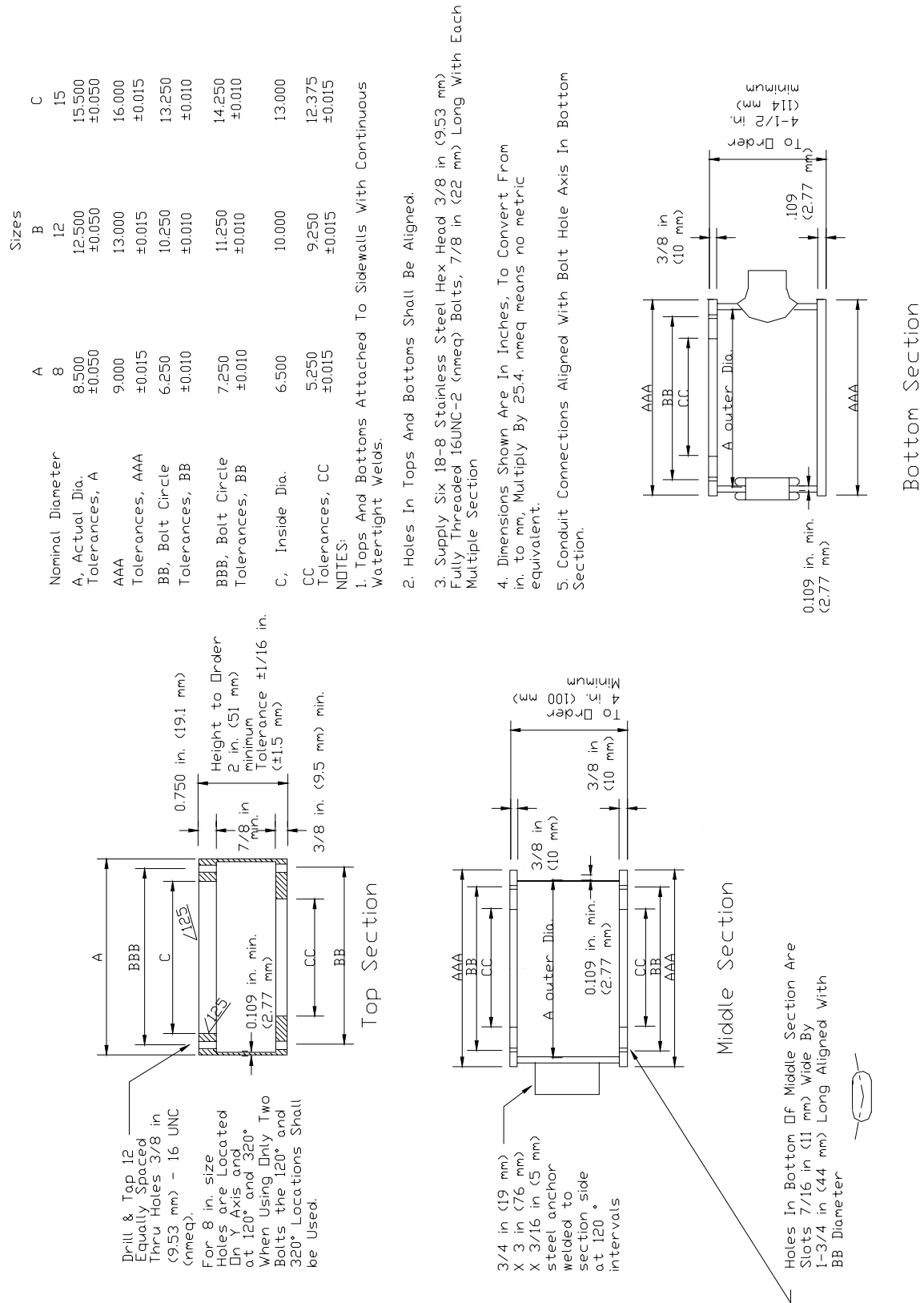


Figure 7. Sectional Body, Type L-868, Class IA, Class IB

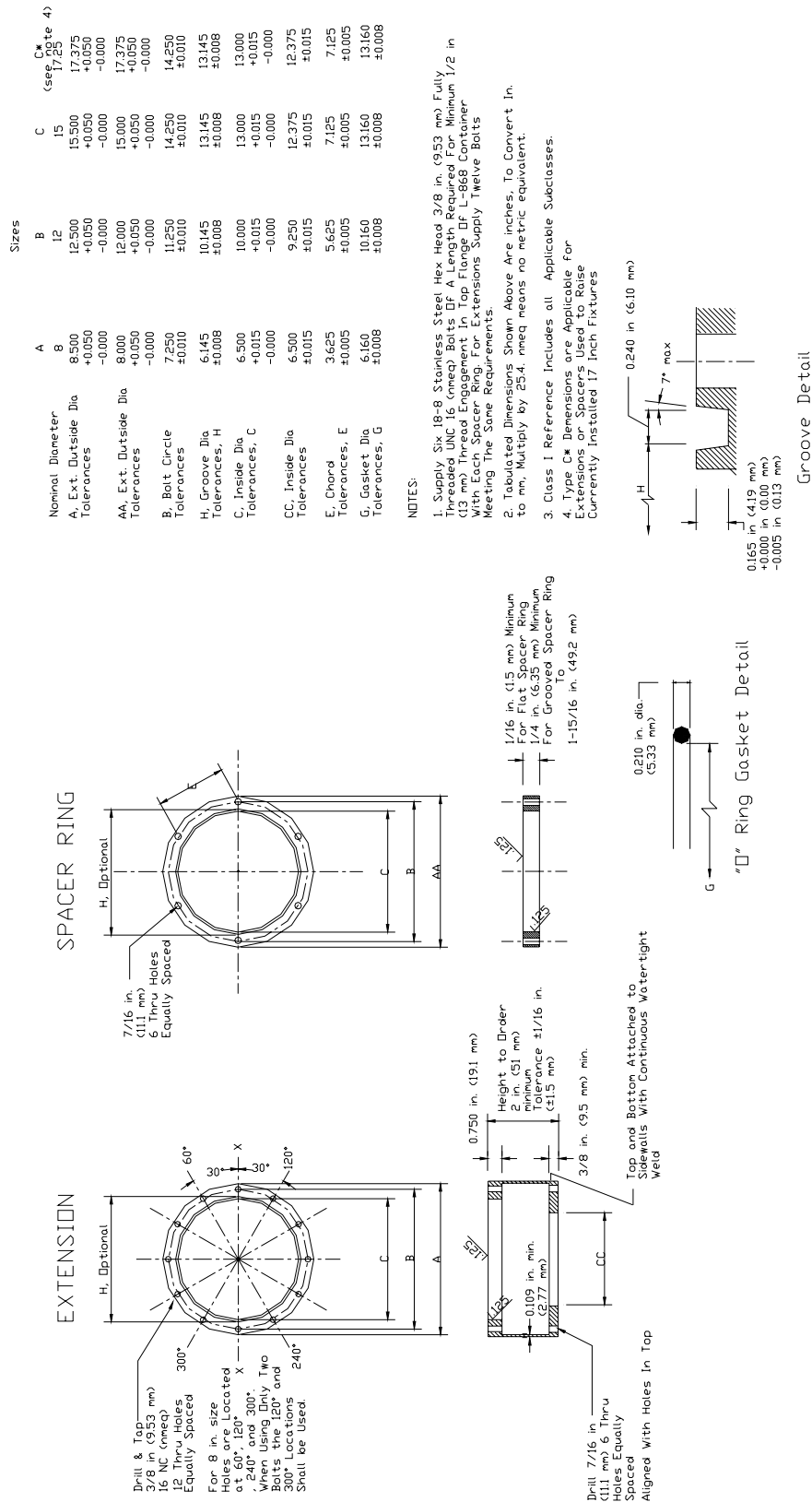


Figure 8. Extensions, Type L-868 Class IA, Class IB

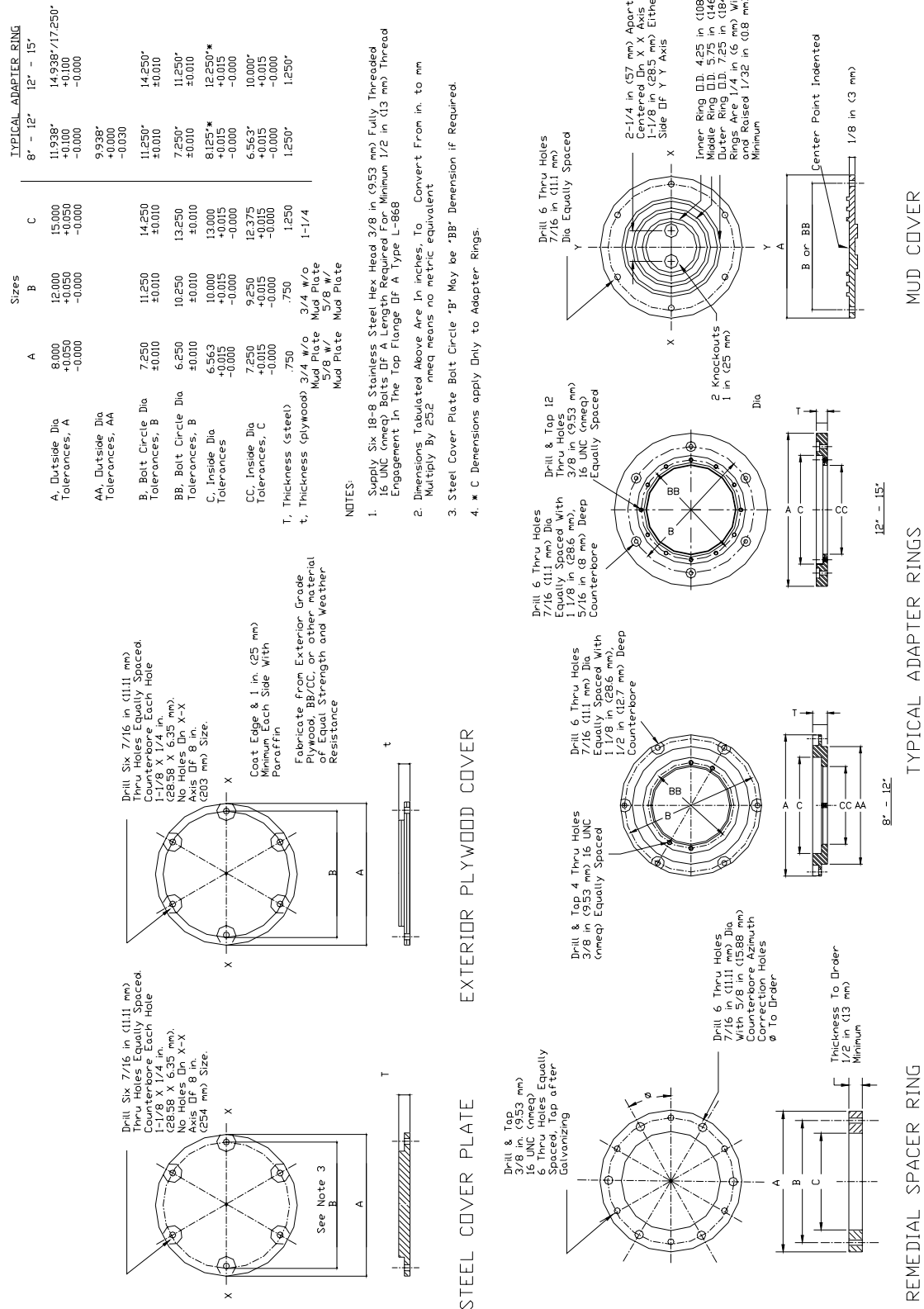


Figure 9. Accessories, Type L-868

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APPENDIX

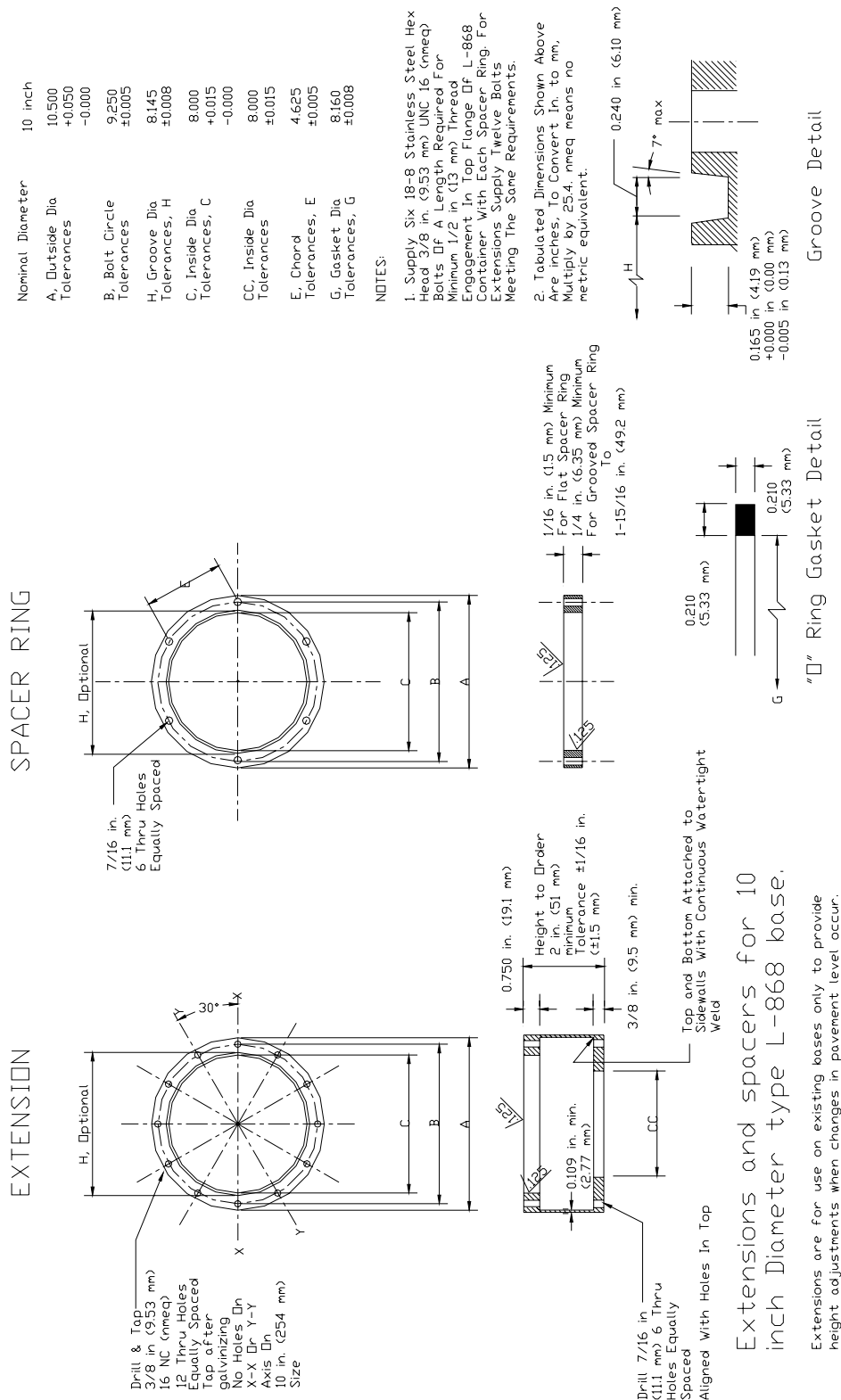


Figure A-1. Extensions and Spacers for 10-inch Diameter type L-868 Base, for Maintenance of Existing Installations Only

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